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The analysis of temperature regime in coastal areas of the northwest Japan Sea by the climatic periods

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To estimate possible aftereffects of climatic changes and their impact on environment and economy, the investigations of climatic changes in some regions are of special interest. The study concerns the long-term data series of the instrumental observations of the sea surface water temperature and the air temperature, executed at four hydrometeorological stations (HMS) of the Peter-the-Great Bay. It was analyzed the variability of parameters calculated for each thirtieth normal series, determined by The World Meteorological Organization of climatic norms. These series are: 1901-1930 (I), 1931-1960 (II), 1961-1990 (III) and 1991-2003 (IV) - the modern period is equal to 13 years. For each "normal" period it is counted the selective average values of series of the monthly average temperature at each station, and then between each next period the anomalies of monthly average temperature (Δt) are found.

Considering that at the HMS of Vladivostok the observations have been already conducted for more than 100 years, it is possible to track the variability of hydrometeorological parameters for a century period and to find out, what is the response of the researched area on the world global warming determined by many scientists (Table).

Change of temperature for the semicentenial and century periods at stations of the Peter-the-Great Bay

Water temperature, ^{0}C		Air temperature, ^{0}C	
Possyet	+0.25°C/50 years	Possyet	+0.95°C/50 years
Gamov	+0.15°C/50 years	Gamov	+0.73°C/50 years
Nakhodka	-0.27°C/50 years	Nakhodka	+1.82°C/50 years
Vladivostok	+0.94°C/50 years; +0.64°C/100 years	Vladivostok	+1.96°C/50 years, +1.74°C/100 years

Conclusions

1. At the present stage the comparison of anomalies between stations shows the growth both of the monthly average temperature of water (except for August at the HMS of Possyet), and the average-annual temperature of water (from 0,5°C at the HMS of Possyet up to 0,8°C at the HMS of Vladivostok and Nakhodka).
2. Comparison of anomalies between the periods shows, that there was an increase in the air temperature to a lesser degree during a warm season and more significant (up to 3,3°C) – during the cold one.
3. At all hydrometeorological stations of the Peter-the-Great Bay for the last 50 years, and in Vladivostok for 100 years, it took place an increase in the air temperature, and at three of them – an increase in the temperature of water, except for Nakhodka where some temperature decrease took place.

Keywords: hydrometeorological stations, the air temperature, the water temperature, "normal" period, the anomalies of monthly and years average temperatures.